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EXAMINER

SORKIN, DAVID L

ART UNIT

PAPER NUMBER

1723

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/275,534

Applicant(s)

JAHN ET AL.

Examiner

David L. Sorkin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 17-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 30 January 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 30 January 2002 have been approved.

### ***Specification***

2. The disclosure is objected to because of the following informalities: In the amendment of page 5, filed 21 March 2002, the phrase "parallel walls of the channels may, however, also form an angle  $\beta$  of  $\pm 30$  degrees to the channel walls" is objected to. Apparently, "parallel walls of the channels" should read - - parallel walls of the orifices".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. It is suggested that the phrase "passing though the radial center of the disc, said center axis being parallel to the surfaces defining the circumference of the disc" be deleted from claims 2 and 3 and that "said center axis being parallel to the surfaces defining the circumference of the disc" be deleted from claims 9, 17 and 22 because it is well understood that a disc has exactly one center axis by definition. (Such is not the case for an "orifice", however.) It is also suggested that "the plane" read "a plane" in line 3 of claims 2 and 3.

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5. Claims 9, 14, 15, 17 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
6. In claims 9, 17 and 22 there is lack of antecedent basis for "the plane(s) which lie across and touch(es) the highest elevation...". At least three non-colinear points are required to define a plane. The claims should make clear that some structure is required that defines a given plane, before referring to "the plane". There is no particular antecedent basis for "the highest elevation", and one or even two high points would not suffice to define a plane.
7. In claim 14, there is lack of antecedent basis for "the mixing channels of one of said mixer modules" and "the inlet channels of the other of said mixer modules". While claim 13 recites, "at least two disc-shaped static mixer modules", neither of these modules is recited to have mixing channels and neither is recited to have inlet channels.
8. In claim 15 is unclear which two of the several modules are being references by the phrases "the two static mixer modules" and "the two modules". Parent claim 13 recites "at least two disc-shaped modules" and parent claim 12 recites "a disc-shaped static mixer module", it is unclear which two of these at least three module are being recited.
9. In claims 22 and 17, it is unclear what "the module" and similar phrases refer to. Claim 22 recited "at least one module" and parent claim 12 recites "a disc-shaped static mixer module" at is unclear which of these at least two module is being referred to.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2, 5, 7, 12-15, 18 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Monkelbaan et al. (US 5,554,329). Regarding claim 1, Monkelbaan ('329) discloses a static mixer module (2) comprising a one piece disc having a front side and a rear side which is provided with a multiplicity of orifices (4,5) and which is structured on its front by inlet channels and on its rear side by mixing channels running in parallel and defined by channel walls, and in which the orifices pass through the walls defining the mixing channels (see Figs. 1-3). Regarding claim 2, the channels have straight walls which are at an angle of 5-85 degrees (see col. 4 line 51 to col. 5 line 10). Regarding claim 5, the inlet channels and the mixing channel have V-shaped cross-sectional profile (see Fig. 2). Regarding claim 7, the mixer module is divided into two or more regions or segments which have different spacings between the orifices, a different cross-sectional openings of the orifices or both (see Fig. 1; col. 5, lines 11-15). Regarding claim 12, a mixer arrangement is disclosed comprising at least two static mixer elements arranged one behind the other wherein at least one mixer element is a disc-shaped static mixer module according to claim 1 (see Fig. 4). Regarding claim 13, at least two disc-shaped static mixer modules are arranged directly one behind the other (see Fig. 1). Regarding claim 14, the disc-shaped static mixer modules are

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positioned in such a way that the mixing channels of one of said mixer modules are arranged so as to be offset or rotated relative to the inlet channels of the other of said mixer modules (see col. 5, lines 20-28). Regarding claim 15, the two static mixer modules have parallel sets of straight inlet channels and mixing channels and the mixing channels and the inlet channels of the two modules are rotated relative to one another at an angle  $\gamma$  of 5-175 degrees (see col. 5, lines 20-28). Regarding claim 18, at least two mixer modules according to claim 1 are installed in a pipe (1). Regarding claim 21, the arrangement is installed in a pipe (1).

12. Claims 1, 2, 5, 6, 10, 12-15, 18, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Hutchinson (US 2,767,967). Regarding claim 1, Hutchinson ('967) discloses a static mixer module comprising a one piece disc (12) having a front side and a rear side which is provided with a multiplicity of orifices (36) and which is structured on its front side by inlet channels and on its rear side by mixing channels running parallel to each other (Fig. 2) or concentrically (Fig. 9) to each other, and defined by channel walls and in which the orifices pass through the walls defining the mixing channels. Regarding claim 2, the inlet channels the mixing channels, or both, have straight channel walls which are at an angle of 5-85 degrees (see col. 6, lines 10-23;  $\arctan(0.5) \cong 27$  degrees). Regarding claim 5, the inlet channels, the mixing channels, or both, have V-shaped, U-shaped, rectangular or trapezoidal cross-sectional profile (see Figs. 3 and 5-8). Regarding claim 6, the mixer module is divided into two or more regions or segments which have differently arranged, differently structured, or both, inlet channels, mixing channels, or both (see Fig. 10; col. 3, lines 25-28).

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Regarding claim 10, the module has baffle surfaces on the front side (see Fig. 6-8; col. 5, 59-68). Regarding claim 12, a mixer arrangement is disclosed comprising at least two static mixer elements arranged one behind the other wherein at least one mixer element is a disc-shaped static mixer module according to claim 1 (see Fig. 4).

Regarding claim 13, at least two disc-shaped static mixer modules are arranged directly one behind the other (see Fig. 1). Regarding claim 14, the disc-shaped static mixer modules are positioned in such a way that the mixing channels of one of said mixer modules are arranged so as to be offset or rotated relative to the inlet channels of the other of said mixer modules (see Figs. 1 and 2; col. 4, lines 34-40). Regarding claim 15, the two static mixer modules have parallel sets of straight inlet channels and mixing channels and the mixing channels and the inlet channels of the two modules are rotated relative to one another at an angle  $\gamma$  of 5-175 degrees (see Figs. 1 and 2; col. 4, lines 34-40). Regarding claim 18, at least two mixer modules according to claim 1 are installed in a pipe (10). Regarding claim 20, the baffle surfaces are flattenings (see Figs. 6-8; col. 5, lines 59-68). Regarding claim 21, the arrangement is installed in a pipe (10).

13. Claims 1, 2, 5, 11-15, 18, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by King (US 5,605,399). Regarding claim 1, King ('399) discloses a static mixer module comprising a one-piece (see col. 4, lines 3-16) disc (12) having a front side and a rear side which is provided with a multiplicity of orifices (relatively large rectangular orifices, fig. 3) and which is structured on its front side by inlet channels and on its rear side by mixing channels running in parallel, and in which the orifices pass

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through walls defining the mixing channels. Regarding claim 2, the inlet channels have straight walls which are at an angle of 5-85 degrees to the disc plane (fig. 3). Claim 5, the inlet channels of King ('399) have a V-shaped cross-sectional profile (fig. 3).

Regarding claim 11, the module consists of non-ferrous metal (column 4, line 6).

Regarding claim 12, King ('399) discloses a mixer arrangement comprising at least two static mixer elements arranged one behind the other (fig. 3), wherein at least one mixer element is the disc-shaped static module described above with regard to instant claim 1.

Regarding claim 13, at least two modules are directly behind one another (see fig. 3).

Regarding claim 14, mixing channels of a first mixer are rotated relative to the inlet channels of a second mixer (see col. 4, lines 44-49). Regarding claim 15, the mixers are between 5 and 175 degrees relative to one another (see col. 4, lines 44-49).

Regarding claim 18, King ('399) discloses a mixer with at least two of the static mixer modules discussed above regarding instant claim 1, in which the mixer modules are installed in a pipe. Regarding claim 21, the mixer arrangement is installed in a pipe (fig. 3).

14. Claims 1, 2, 5-10 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Pellerin (US 4,295,458). Regarding claim 1, Pellerin ('458) discloses a static mixer module comprising a one piece disc having a front side and a rear side which is provided with a multiplicity of orifices and which is structured on its front by inlet channels and on its rear side by mixing channels running in parallel and defined by channel walls and in which the orifices pass through the walls defining the mixing channels (see figs. 5 and 6). Regarding claim 2, the inlet channels and mixing channels



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have straight flanks which are at an angle of 5-85 degrees to the disc plane (see fig. 5).

Regarding claim 5, the channels have a V-shaped profile (see fig. 5). Regarding claim

6, the mixer module is divided into two or more regions which have differently arranged or differently structured inlet channels and mixing channels (see fig. 5 and col. 2 lines

14-15). Regarding claim 7, the mixer module is divided into two or more regions which have different spacings between the orifices or different cross-sectional openings of the

orifices (see col. 2 lines 14-15). Regarding claim 8 the boundaries of the regions are

arranged concentrically about a center point of the mixer module (see fig. 6). Regarding

claim 9, the spacing between the planes of the front side and the planes of the rear side

of the mixer is different in the various regions (see fig. 5). Regarding claim 10, the

baffle has on the front side baffle surfaces (see fig. 5). Regarding claim 20, the baffle

surfaces are flattenings or sheet-like elevations (see fig. 5).

15. Claims 1, 5-9, 12-14, 17, 18, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Selg (US 951,290). Regarding claim 1, Selg ('290) discloses a static mixer module comprising a one piece disc (12 or 16 or 19) having a front side and a rear side which is provided with a multiplicity of orifices (13 or 17) and which is structured on its front by inlet channels and on its rear side by mixing channels running concentrically and defined by channel walls and in which the orifices pass through the walls defining the mixing channels (see Figs. 1-3). Regarding claim 5, the channels have a V-shaped profile (see Figs. 1 and 3). Regarding claim 6, the mixer module is divided into two or more regions or segments which have differently structured inlet channels or mixing channels (see Figs. 1 and 3). Regarding claim 7, the mixer module

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is divided into two or more regions or segments which have different spacings between the orifices (see Figs. 1-3). Regarding claim 8 the boundaries of the regions are arranged concentrically about a center point of the mixer module (see Figs. 1-3). Regarding claim 9, the distance between planes which lie across and touch the highest elevations, in the direction of the central axis of the disc shaped module, said center axis being parallel to the surfaces defining the circumference of the disc, on the front side, and the rear side of the mixer module is different in the various regions or segments (see Figs. 1 and 3). Regarding claim 12, a mixer arrangement is disclosed in which two mixer elements are arranged one behind the other, and at least one mixer element is a disk shaped static mixer module according to claim 1. Regarding claim 13, at least two modules are directly behind one another (see fig. 3). Regarding claim 14, the disc-shaped mixer modules are positioned in such a way that the mixer channels of one of said mixer modules are arranged so as to be offset or rotated relative to the inlet channels of the other of said mixer modules (see Figs. 2 and 3). Regarding claim 18, two mixer modules according to claim 1, installed in a pipe are disclosed (see Figs. 1 and 3). Regarding claim 21, the mixer arrangement is installed in a pipe (see Figs. 1 and 3). Regarding claim 22, at least one module which is divided into two or more regions or segments each of which has different spacings between the orifices and wherein the distance between the planes which lie across and touch the highest elevations, in the direction of the center axis of the disc shaped, said module being followed directly by a static mixer module being followed directly by a static mixer element or a disc-shaped mixer module adapted to nest with the module (see Fig. 3).

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Regarding claim 17, the arrangement of the module of the static mixer is designed in such a way that the static mixer terminates flush with either the plane which lies across and touches the highest elevations, in the direction of the center axis of the disc shaped module, said center axis being parallel to the surfaces defining the circumference of the disc (see Fig. 3).

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 3 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchinson (US 2,767,967). Regarding claim 3, the module of Hutchinson ('967), discussed above with regard to claim 1, further includes spacer contours (see Figs. 6-8); however, the channel walls forming an angle of less than 15 degrees is not explicitly disclosed. However, it is considered that the statement in col. 6, lines 45-54 would have suggested an angle in this range to one of ordinary skill in the art. Regarding claim 19, bosses, teeth or warts are disclosed (see Figs. 6-8 and 11).

18. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchinson (US 2,767,967) in view of Sarem (US 3,582,048). The module of Hutchinson ('967), discussed above with regard to claim 1 fails disclose the parallel walls of the orifices forming an angle of 30 degrees with the walls through which they pass. Sarem ('048) teaches parallel walls of orifices forming an angle of 30 degrees

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with the walls through which they pass (see col. 29-33). It is considered that it would have been obvious to one of ordinary skill in the art to have placed the orifices of Hutchinson ('967) of at an angle of 30 degrees as taught by Sarem ('048), because Sarem ('048) teaches that improved mixing results therefrom (see col. 3, lines 25-73).

### ***Response to Arguments***

19. Applicant argues that the module of King ('399) is not "one piece". Applicant argues that because King ('399) disclose a method of making the module which involves welding more than one piece together, the claimed limitation "one piece disc" is not met. However, the examiner continues to consider that a one piece module is still a one piece module regardless how many pieces it once was. Applicant's argument is analogous to stating that a pane of glass is not one piece because it once was thousands of separate grains of sand. It is further noted that the instant specification specifically refers to welding multiple pieces together to make one piece: "has to be welded as an individual piece" (page 12, line 33).

20. Applicant states "Pellerin discloses a truncated cone" and "A cone is not a disc". However, according to applicant's Figs. 7 and 8, a disc module may comprise cones. Both Pellerin's Figs. 5 and 6 and applicant's Figs. 7 and 8 depict a disc module comprising a plurality of concentric cones.

### ***Conclusion***

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Sorkin whose telephone number is 703-308-1121. The examiner can normally be reached on 8:00 -5:30 Mon.-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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*David Sorkin*

David Sorkin

May 28, 2002

*Charles E. Cooley*

**CHARLES E. COOLEY  
PRIMARY EXAMINER**